UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of Report (Date of Earliest Event Reported): **January 9, 2017**

Blueprint Medicines Corporation

(Exact name of registrant as specified in its charter)

Delaware	**001-37359**	**26-3632015**
(State or other jurisdiction of incorporation)	(Commission File Number)	(I.R.S. Employer Identification No.)

38 Sidney Street, Suite 200 **Cambridge, Massachusetts**	**02139**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: **(617) 374-7580**

(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 7.01 Regulation FD Disclosure.

Blueprint Medicines Corporation (the "Company") from time to time presents and/or distributes to the investment community at various industry and other conferences slide presentations to provide updates and summaries of its business. The Company is posting to the "Investors" portion of its website at http://ir.blueprintmedicines.com/ a copy of its current corporate slide presentation. These slides are attached to this Current Report on Form 8-K as Exhibit 99.1. The Company undertakes no obligation to update, supplement or amend the materials attached hereto as Exhibit 99.1.

The information in Item 7.01 of this Current Report on Form 8-K, including Exhibit 99.1 attached hereto, is intended to be furnished and shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act, except as expressly set forth by specific reference in such filing.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

Exhibit No.	Description
99.1	Corporate slide presentation of Blueprint Medicines Corporation dated January 9, 2017

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

BLUEPRINT MEDICINES CORPORATION

Date: January 9, 2017

By: /s/ Jeffrey W. Albers
Jeffrey W. Albers
Chief Executive Officer

EXHIBIT INDEX

Exhibit No.	Description
99.1	Corporate slide presentation of Blueprint Medicines Corporation dated January 9, 2017

Exhibit 99.1


blueprint
MEDICINES
Revolutionizing the Development
of Targeted Medicines for the
Treatment of Serious Diseases
January 2017

Forward-looking statements

This presentation contains forward-looking statements as defined in the Private Securities Litigation Reform Act of 1995, as amended. The words "may," "will," "could," "would," "should," "expect," "plan," "anticipate," "intend," "believe," "estimate," "predict," "project," "potential," "continue," "target" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

In this presentation, forward-looking statements include, without limitation, statements about plans and timelines for the clinical development of BLU-285, BLU-554 and BLU-667 and the ability of Blueprint Medicines Corporation (the "Company") to implement those clinical development plans; the potential benefits of the Company's current and future drug candidates in treating patients; plans and timelines for regulatory submissions, filings or discussions; plans and timelines for the development and commercialization of companion diagnostics for the Company's current or future drug candidates; plans and timelines for current or future discovery programs; plans and timelines for future collaborations, if any, with strategic partners; the future financial performance of the Company; and the Company's strategy, business plans and focus. The Company has based these forward-looking statements on management's current expectations, assumptions, estimates and projections. While the Company believes these expectations, assumptions, estimates and projections are reasonable, such forward-looking statements are only predictions and involve known and unknown risks, uncertainties and other important factors, many of which are beyond the Company's control and may cause actual results, performance or achievements to differ materially from those expressed or implied by any forward-looking statements. These risks and uncertainties include, without limitation, risks and uncertainties related to the delay of any current or future clinical trials or the development of the Company's drug candidates, including BLU-285, BLU-554 and BLU-667; the Company's advancement of multiple early-stage efforts; the Company's ability to successfully demonstrate the efficacy and safety of its drug candidates; the preclinical and clinical results for the Company's drug candidates, which may not support further development of such drug candidates; actions or decisions of regulatory agencies or authorities, which may affect the initiation, timing and progress of current or future clinical trials; the Company's ability to obtain, maintain and enforce patent and other intellectual property protection for any drug candidates it is developing; the Company's ability to develop and commercialize companion diagnostics for its current and future drug candidates, including a companion diagnostic for BLU-554 with Ventana Medical Systems, Inc. and a companion diagnostic for BLU-285 with QIAGEN Manchester Limited; and the success of the Company's rare genetic disease collaboration with Alexion Pharma Holding and its cancer immunotherapy collaboration with F. Hoffmann-La Roche Ltd and Hoffmann-La Roche Inc.

These and other risks and uncertainties are described in greater detail under "Risk Factors" in the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, as filed with the Securities and Exchange Commission ("SEC") on November 10, 2016, and any other filings the Company may make with the SEC in the future. The Company cannot guarantee future results, outcomes, levels of activity, performance, developments, or achievements, and there can be no assurance that the Company's expectations, intentions, anticipations, beliefs, or projections will result or be achieved or accomplished. The forward-looking statements in this presentation are made only as of the date hereof, and except as required by law, the Company undertakes no obligation to update any forward-looking statements contained in this presentation as a result of new information, future events or otherwise.

This presentation also contains estimates, projections and other statistical data made by independent parties and by the Company relating to market size and growth and other data about the Company's industry. These data involve a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. In addition, projections, assumptions and estimates of the Company's future performance and the future performance of the markets in which the Company operates are necessarily subject to a high degree of uncertainty and risk.

Successful execution in 2016 establishes momentum for 2017

2016 ACCOMPLISHMENTS	
Clinical Development	✓ Achieved proof-of-concept in 3 lead clinical trials in 4 patient populations ✓ Filed IND for BLU-667 in RET
Discovery	✓ Disclosed new PRKACA discovery program ✓ Initiated new wholly-owned and partnered programs
Corporate	✓ Maintained financial strength, including a December 2016 financing of ~$135M in net proceeds ✓ Entered into strategic cancer immunotherapy collaboration with Roche

2017: Blueprint Medicines' vision becoming realized

DATA MATURING AND EXPANDING DEVELOPMENT 1

- BLU-285: plan to present updated data in advanced GIST and SM, initiate new studies
- BLU-554: plan to present updated data in advanced HCC

ESTABLISH REGISTRATION PATHWAY 2

- Interactions with global regulatory authorities
- Advance most rapid path to NDA

ADVANCING PIPELINE 3

- BLU-667: initiate phase 1 study in NSCLC, thyroid and other solid tumors
- Progress wholly-owned and partnered programs and initiate new programs

BUSINESS DEVELOPMENT 4

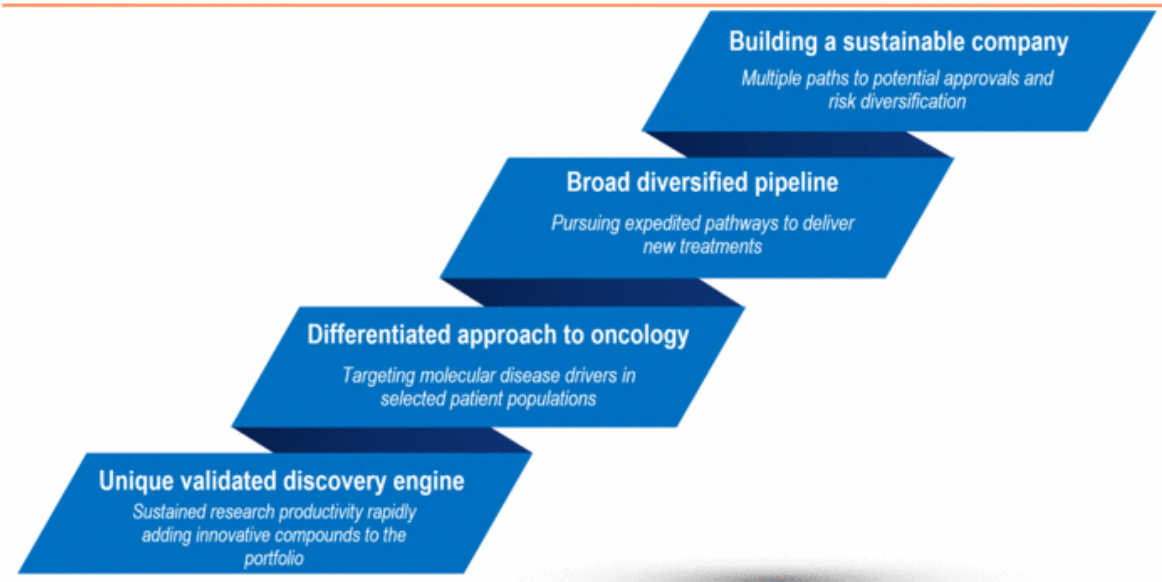
- Evaluate collaboration opportunities with strategic partners who have a global reach and can accelerate bringing potential new therapies to patients

Potential 2017 milestones

PROGRAM	MILESTONE
BLU-285 GIST	Update data from dose escalation in PDGFRα-driven advanced GIST*
	Update data from dose escalation in KIT-driven advanced GIST*
	Initiate expansion stage of Phase 1 study*
	Explore expedited clinical development pathways with regulatory authorities
	Expand clinical development plan to include opportunities for earlier lines of therapy or combinations
BLU-285 SM	Update data from Phase 1 study in advanced SM
	Initiate expansion stage of Phase 1 study
	Expand clinical development plan to include opportunities for additional indications
BLU-554 HCC	Update data from Phase 1 study in advanced HCC
	Enroll expansion stage of Phase 1 study
BLU-667 RET	Initiate Phase 1 dose escalation study*
Corporate	Explore potential strategic collaborations
	Advance discovery pipeline with the nomination of at least one new discovery program

* Anticipated 1H 2017

Innovative science and talented people drive Blueprint Medicines



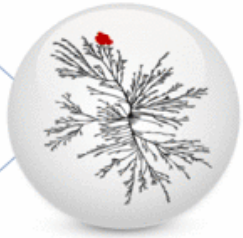
Unparalleled discovery platform that rapidly advances drug candidates

UNIQUE COMPOUND LIBRARY

- High-quality medicinal chemistry starting points
- Ability to craft drug candidates to previously difficult targets

TARGET DISCOVERY ENGINE

- Precision target product profiles
- Identify targets from Kinases of Unknown Biology (KUBs)

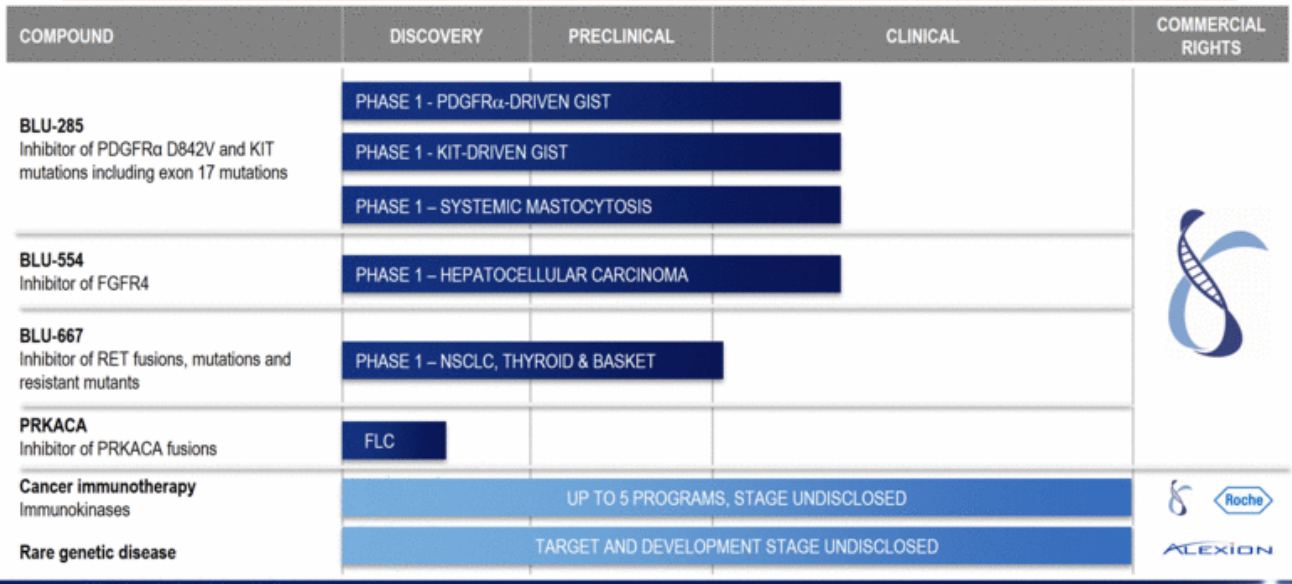


HIGHLY SELECTIVE AND POTENT KINASE INHIBITOR DRUG CANDIDATES

- BLU-285 – Inhibitor of PDGFRα and KIT mutations
- BLU-554 – Inhibitor of FGFR4
- BLU-667 – Inhibitor of RET fusions and mutations

Kinome illustration reproduced courtesy of CSTI (cellsignal.com). The foregoing website is maintained by CSTI, and Blueprint Medicines is not responsible for its content.

Robust pipeline of diverse clinical-stage assets



FLC, Fibrolamellar carcinoma; GIST, advanced gastrointestinal stromal tumors; NSCLC, non-small cell lung cancer
All Phase 1 studies are in advanced disease

Leveraging our scientific platform in collaborations

KINASE-FOCUSED DRUG DISCOVERY PLATFORM

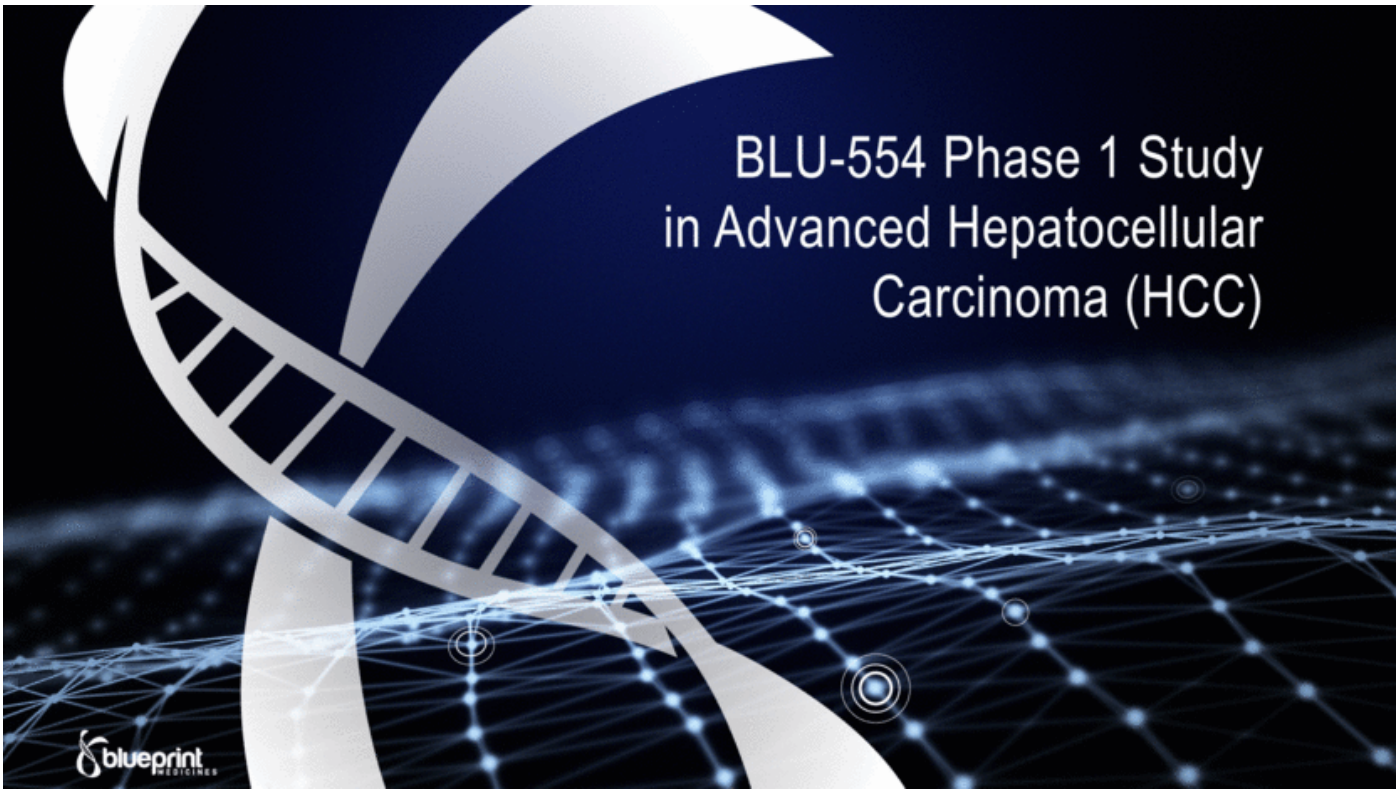
ALEXION RARE GENETIC DISEASE EXPERTISE

- Undisclosed kinase target in a rare genetic disease
- Blueprint responsible for discovery and preclinical development
- Up to $250M in milestones*

Roche CANCER IMMUNOLOGY EXPERTISE

- Up to 5 small-molecule therapeutics targeting immunokinases
- Retained research, development and commercial rights
- Up to $250M prior to licensing**

*Includes milestone payments received to date
**Includes $45M upfront payment

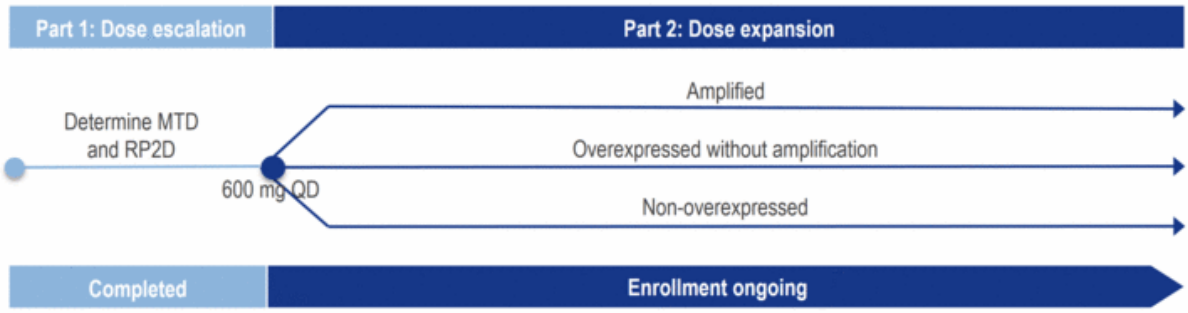

BLU-554 Phase 1 Study
in Advanced Hepatocellular
Carcinoma (HCC)
blueprint
MEDICINES

BLU-554 is a highly selective and potent inhibitor of FGFR4

1. Liver cancer is 2nd leading cause of cancer death worldwide
2. Sorafenib used first line with a response rate ~2%; median time to progression 3-6 months
3. Abnormally activated FGFR4 pathway in ~30% of patients enables biomarker driven patient selection
4. Encouraging single agent activity in heavily pre-treated patients
5. Potential for combinations with IO and other targeted agents

Kinome illustration reproduced courtesy of CSTI (cellsignal.com). The foregoing website is maintained by CSTI, and Blueprint Medicines is not responsible for its content; IO, immuno-oncology

BLU-554 Phase 1 study design in advanced hepatocellular carcinoma

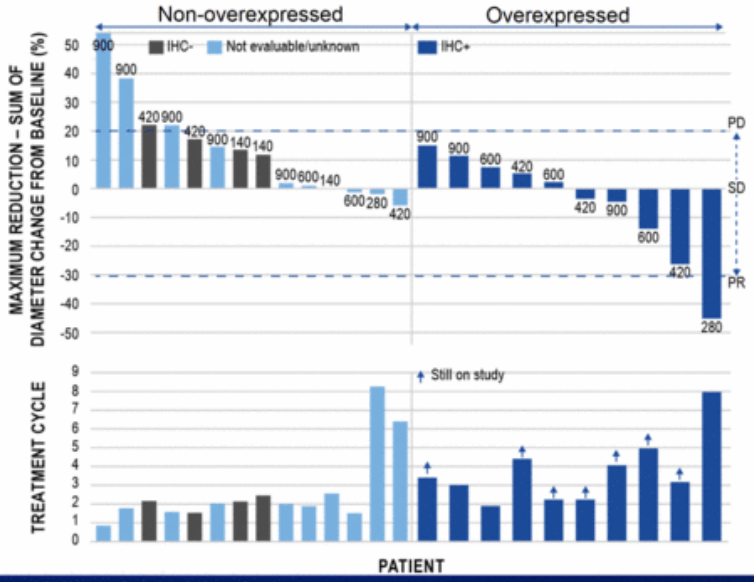


NEXT STEPS

- Assessment of response by FGF19 expression sub-type
- Planning to increase cohort sizes and evaluate BID dosing
- Evaluation of additional development options, including opportunities to move to earlier lines of therapy and combination approaches

BID, twice a day; MTD, maximum tolerated dose; RP2D, recommended Phase 2 dose; QD, once a day;

Proof-of-concept established for highly selective targeting of FGFR4 with BLU-554 in advanced HCC



CLINICAL ACTIVITY

- 5 of 10 FGF19 IHC+ patients with radiographic tumor shrinkage

SAFETY

- MTD defined at 600 mg QD
- 2 patients discontinued BLU-554 due to treatment-related toxicity, 1 treated at a dose above the MTD
- 17 (68%) patients had AEs of Grade 3 or greater, AEs in 12 (48%) were treatment-related

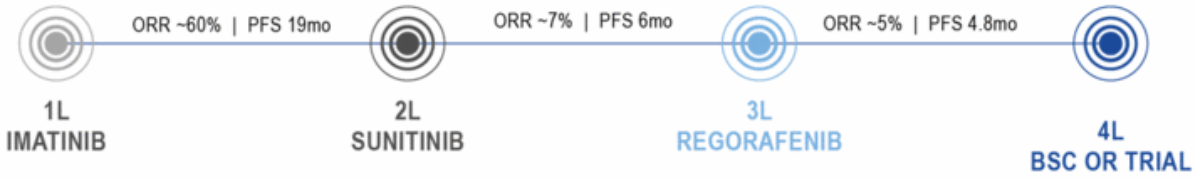
AE, adverse event; DLT, dose limiting toxicity; IHC, immunohistochemistry; PD, progressive disease; PR, partial response; RECIST, Response Evaluation Criteria in Solid Tumors version 1.1; SD, stable disease Data cutoff date: November 7, 2016


BLU-285 Phase 1 Study in
Advanced Gastrointestinal
Stromal Tumors (GIST)
blueprint
MEDICINES

Advanced GIST is a rare sarcoma of the GI tract

PDGFRα-driven patients have no effective treatment options; currently approved therapies' response rate near zero and disease progression occurs within ~ 3 months

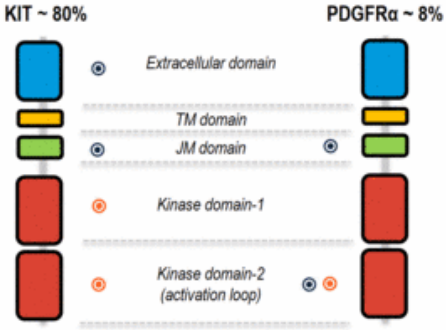
KIT-driven GIST patients eventually run out of options due to available therapies losing impact or intolerable side effects



BSC, best supportive care; GI, gastrointestinal; ORR, objective response rate; PFS, progression-free survival. Cassier (2012) CCR;*18:4466*; Yoo (2016) Can Res Treat; *48:546*; Corless (2005) JCO;*23:5357*; Barnett and Heinrich (2012) Am Soc Clin Onc Ed Book; *663*; Demetri (2006) Lancet;*368:1329*; Demetri (2013) Lancet;*381:295-302*

Activating receptor tyrosine kinase mutations drive metastatic GIST

Activation loop mutations are associated with resistance to therapy



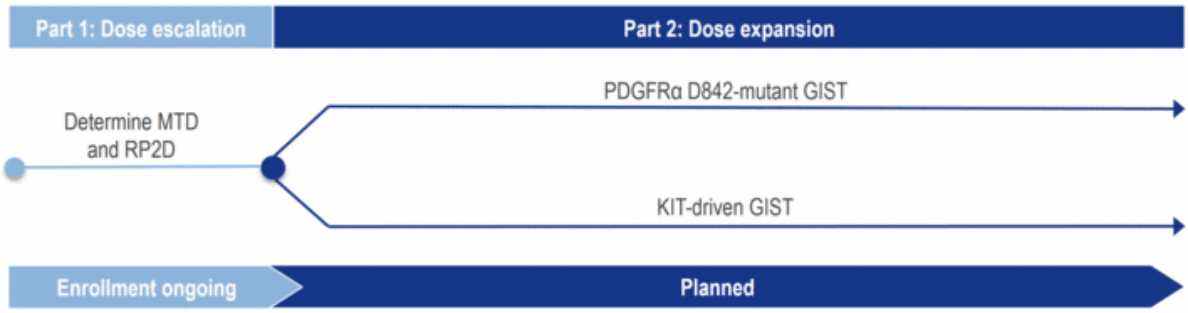
Primary mutational hotspots
- KIT exons 9 or 11
- PDGFRα exons 12 or 18 (D842V)

Resistance mutations
- KIT exons 13 and 17
- PDGFRα exon 18 (D842V)

PREVALENCE		
Resistance mutation	**Primary**	**Secondary**
KIT Exon 17	~ 1%	2L ~ 20% 3L ~ 90%
PDGFRα D842V	~ 5-6%	rare

JM, juxtamembrane; KIT, v-KIT Hardy-Zuckerman 4 Feline Sarcoma Viral Oncogene Homolog; TM, transmembrane. Barnett & Heinrich (2012) Am Soc Clin Oncol Educ Book;663; Nowain et al (2005) J Gastroen Heptol;20:818; Dematteo et al (2000) Ann Surg;231:51; Plumb et al (2013) Clin Radiol;68:770; Joensuu (2006) 17 Suppl 10:x280

Proof-of-concept established for BLU-285 in advanced GIST



SUMMARY OF SAFETY DATA

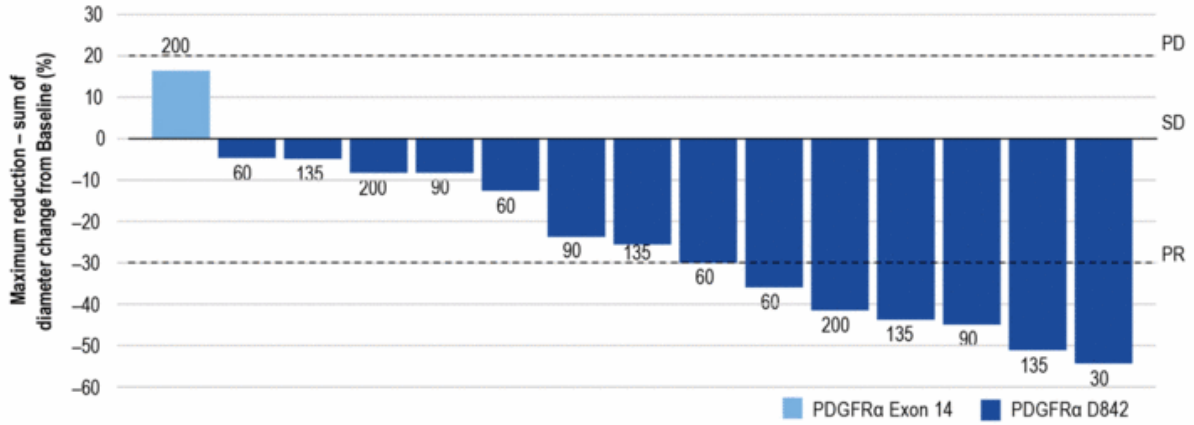
- BLU-285 has been well tolerated on a QD schedule at doses of 30-400mg
- Grade 3 treatment-related AEs in 3 patients
- No DLTs or treatment-related Grade 4 or Grade 5 AEs

NEXT STEPS

- Continue dose escalation to define an MTD and RP2D
- Assessment of response rate by patient sub-type
- Seek guidance from the FDA on the development path forward, including possibilities for expedited clinical development

AE, adverse event; DLT, dose limiting toxicity; MTD, maximum tolerated dose; QD, once a day; RP2D, recommended part 2 dose

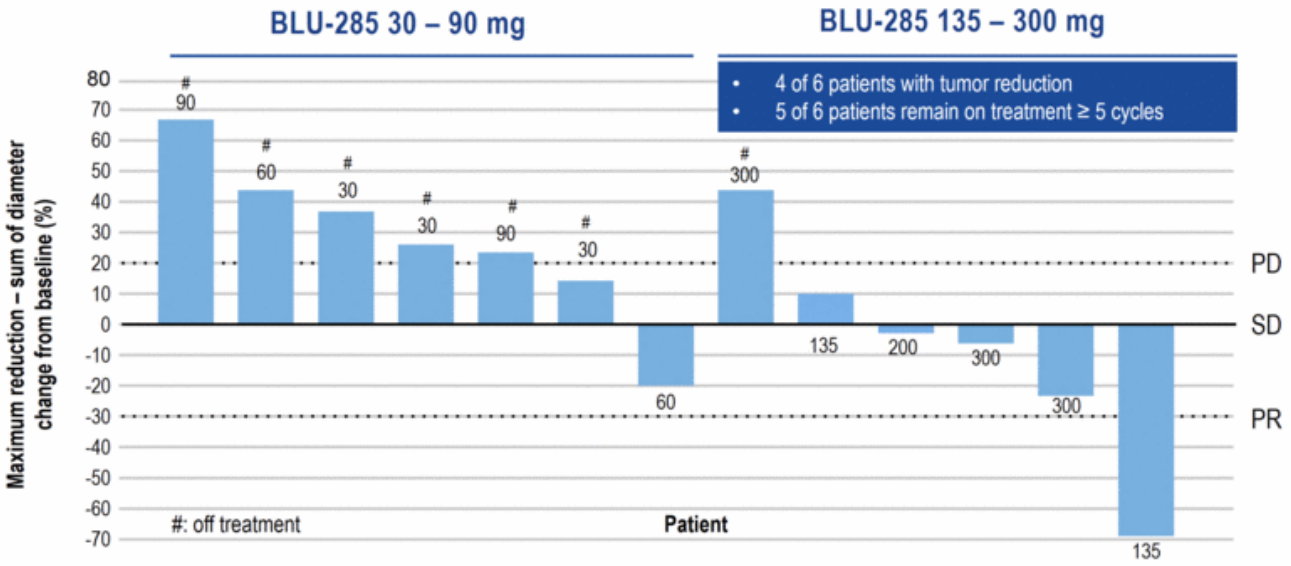
Strong clinical activity against PDGFRα D842-mutant GIST at all dose levels



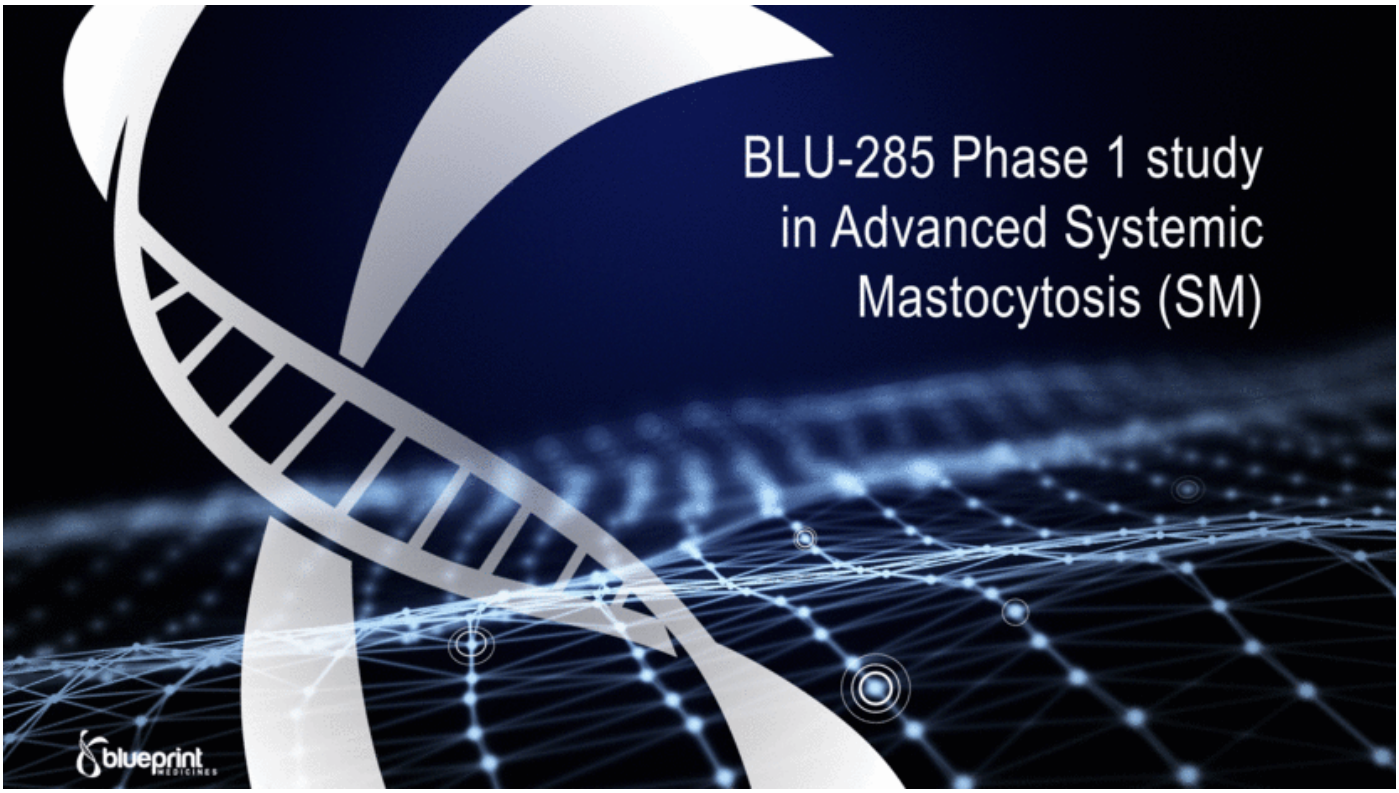
- 14 out of 14 D842-mutant patients with tumor reductions
- All PDGFRα patients remain on treatment

The values above/below the bars denote the dose level (mg) QD received by each patient. PR, partial response; PD, progressive disease; QD, once daily; SD, stable disease. Data cutoff date: November 1, 2016

Significant anti-tumor activity in TKI-resistant KIT-driven GIST at higher doses



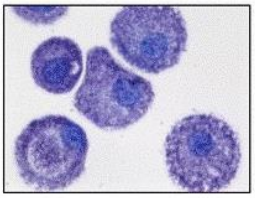
The values above/below the bars denote the dose level (mg) QD received by each patient.
Data cutoff date: November 1, 2016


BLU-285 Phase 1 study
in Advanced Systemic
Mastocytosis (SM)
blueprint
MEDICINES

New treatment options are needed to address the underlying cause of advanced systemic mastocytosis

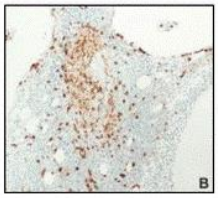
- Advanced systemic mastocytosis is a rare and severe disease that shortens life expectancy with a wide range of debilitating symptoms and organ damage
- KIT mutation D816V is a key driver in ~90-95% of patients[1]

Blood*



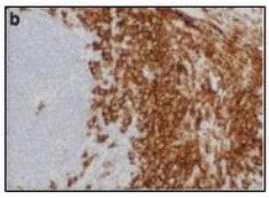
MC degranulation,
MC mediator Sx, ↑tryptase

Bone and Bone Marrow



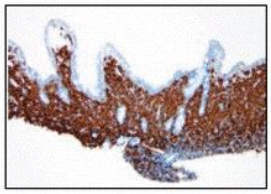
Osteolytic bone lesions,
Cytopenias

Liver and Spleen†



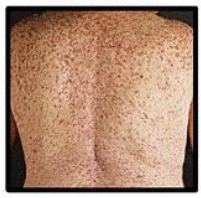
Liver function abnormalities,
Ascites, Hypersplenism

Gastrointestinal Tract‡



Hypoalbuminemia,
Weight loss

Skin§



Urticaria
pigmentosa

BLU-285: Potent, highly selective KIT D816V inhibition

Biochemical profiles

KIT D816V	
	IC_{50} (nM)
BLU-285	0.27
imatinib	8.150
masitinib	> 10K
midostaurin	2.8

BLU-285

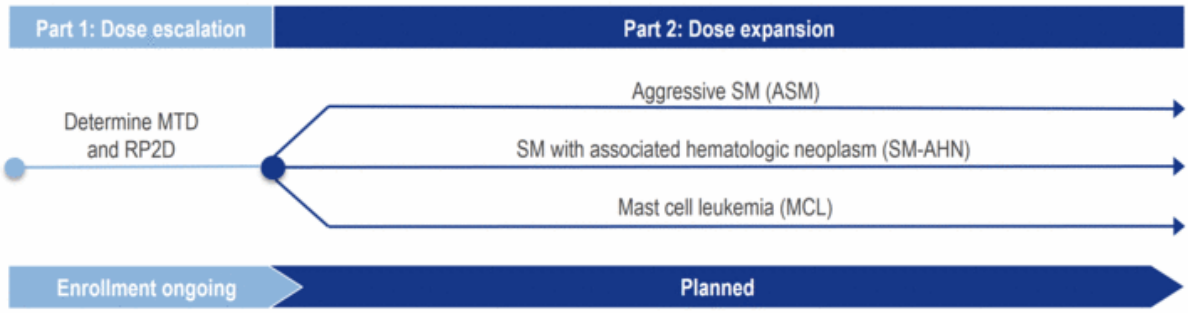
imatinib

masatinib

midostaurin

IC_{50}, half maximal inhibitory concentration
Kinome illustration reproduced courtesy of CSTI (cellsignal.com). The foregoing website is maintained by CSTI, and Blueprint Medicines is not responsible for its content.

BLU-285 Phase 1 study design in advanced systemic mastocytosis

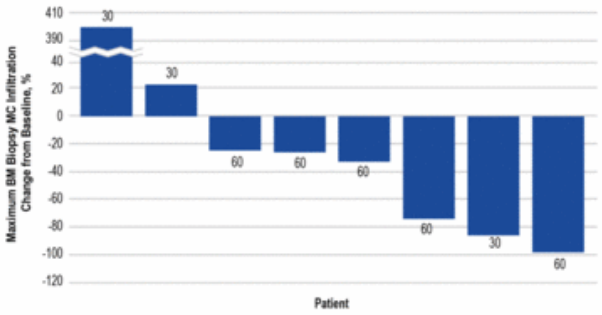


NEXT STEPS

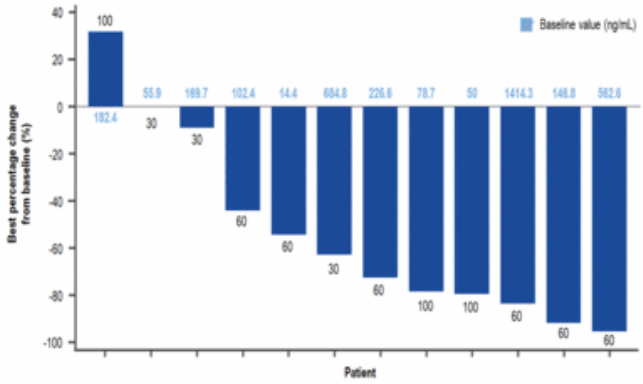
- Continue dose escalation to define an MTD and RP2D
- Assessment of response rate per international working group criteria[1] and evaluation of advanced SM patient reported outcome measure by patient sub-type
- Evaluation of additional development options, including development in indolent SM and KIT-driven acute myeloid leukemia

Encouraging clinical activity with objective decreases in mast cell burden

Decreased bone marrow mast cells in 6 of 8 patients



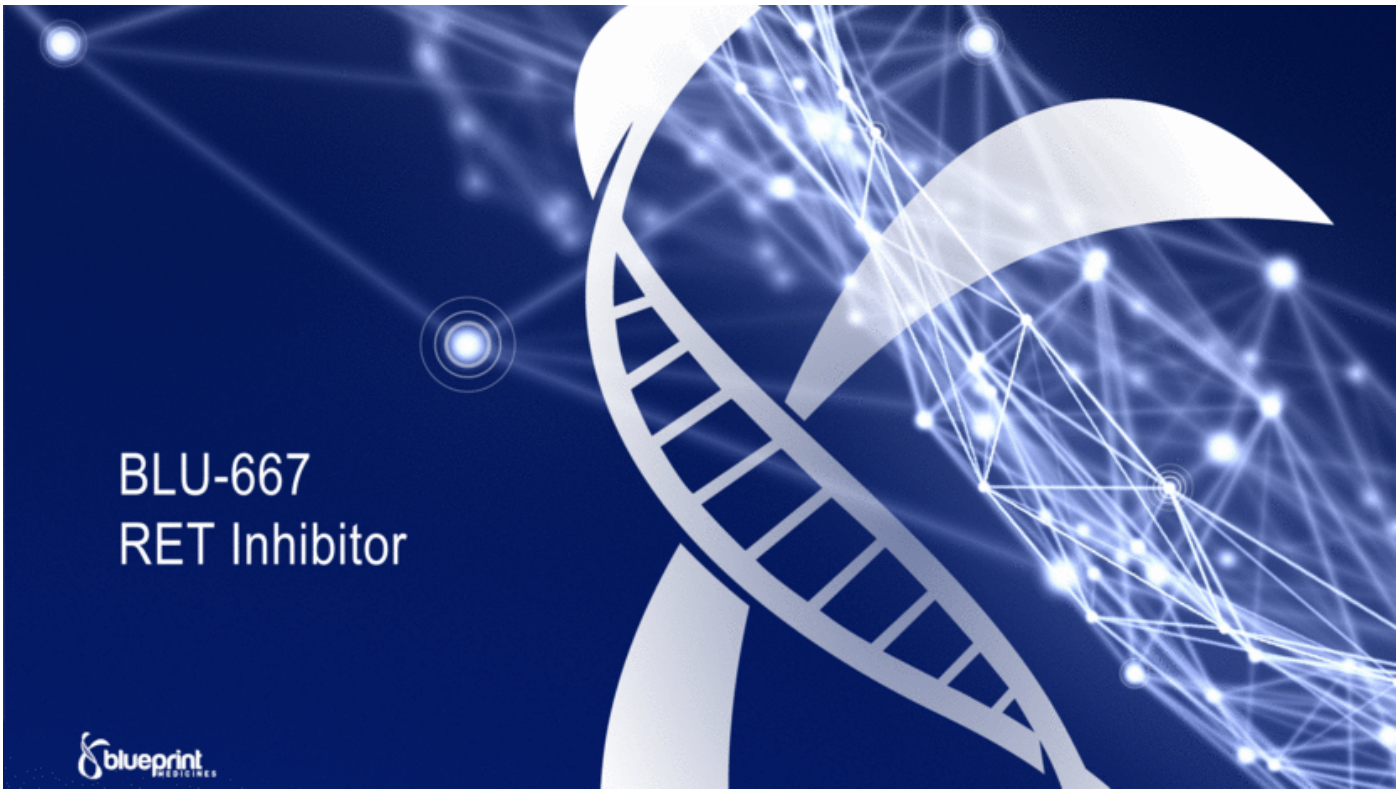
Decreased serum tryptase in 10 of 12 patients



SAFETY

- BLU-285 has been well-tolerated over a dose range of 30mg to 100mg
- 1 DLT: Grade 3 alkaline phosphatase elevation
- Most AEs were Grade 1 or 2 with no Grade 4 or 5 treatment-related events and no dose reductions required for toxicity

AE, adverse event; DLT, dose limiting toxicity; QD, once a day. The values above/below the bars denote the dose level (mg) QD received by each patient.
Data cutoff date: November 11, 2016


BLU-667
RET Inhibitor
blueprint
MEDICINES

BLU-667 is designed as a targeted inhibitor to achieve better RET inhibition

1 ACTIVATING RET KINASE FUSIONS AND MUTATIONS ARE IMPORTANT DISEASE DRIVERS IN A VARIETY OF CANCERS

- Estimate ~10,000 patients in NSCLC and medullary thyroid cancer in major markets*

2 BLU-667: DIFFERENTIATED PRODUCT PROFILE WITH ROBUST PRECLINICAL ACTIVITY

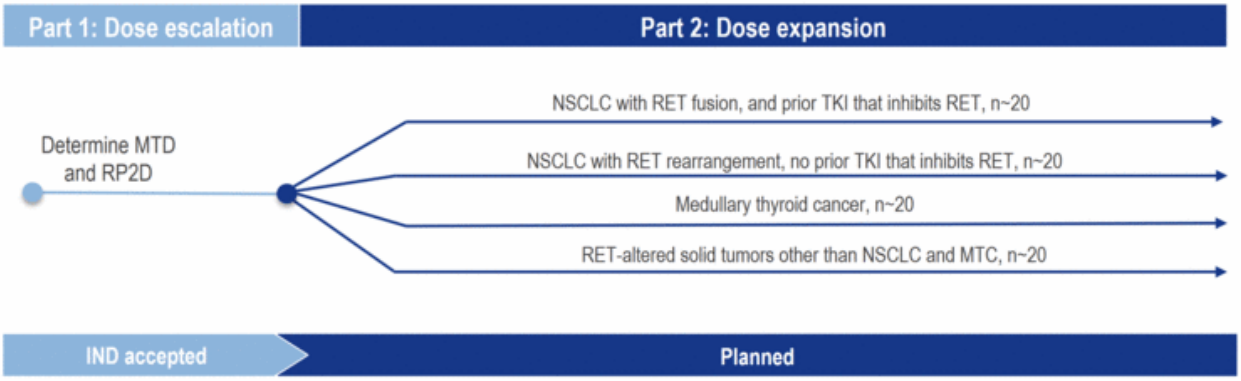
- Potently inhibit RET wild-type fusions in in-vivo models of NSCLC & other cancers
- Potently inhibit oncogenic RET mutants in in-vivo models of thyroid cancer
- Inhibits primary resistance mutations and prevents acquired resistance in in-vivo models
- Spares KDR in a kinome-selective manner

3 PROGRESSING TO THE CLINIC

- IND accepted by FDA for NSCLC, medullary thyroid cancer and other advanced solid tumors
- Expect to initiate Phase 1 clinical trial in 1H 2017

IND, investigational new drug application; KDR, kinase domain receptor; NSCLC, non-small cell lung cancer.
*Represents estimated epidemiology in US, EU5 and Japan.

IND accepted for BLU-667 and study start-up underway



KEY INCLUSION CRITERIA

- Advanced NSCLC, thyroid cancer, or other solid tumor
- Confirmed RET alteration

OBJECTIVES

- Determine MTD and RP2D, assess safety and tolerability, PK, PD and assessment of anti-tumor activity

MTD, maximum tolerated dose; MTC, medullary thyroid cancer; NSCLC, non-small cell lung cancer; PD, pharmacodynamics; PK, pharmacokinetics; RET, rearranged during transfection; RP2D, recommended part 2 dose; TKI, tyrosine kinase inhibitor


PRKACA
blueprint
MEDICINES

Developing first PRKACA-targeted inhibitor for treatment of Fibrolamellar Carcinoma

Patient population

DISEASE	FREQUENCY*	PATIENTS**
FLC (all stages)	>90% with PRKACA fusion	1,700

FLC is a rare and distinct subtype of liver cancer in young adults with high medical need and no approved therapies to date

- Often associated with poor prognosis (5-year OS rate is 30-40%)
- Patient population estimated to be ~1% of HCC in US and EU

DNAJB1-PRKACA fusion identified by both Dr. Sandy Simon at Rockefeller and Blueprint Medicines in 2014

- Honeyman *et al., Science,* 2014; Stransky *et al., Nat Comms,* 2014

PRKACA kinase fusion considered to be the FLC disease driver

- >90% of FLC patients harbor PRKACA fusion (strong scientific rationale)

FLC, fibrolamellar carcinoma; OS, overall survival.
*Represents estimated frequency of PRKACA fusion in patients with FLC.
** FLC patient estimates represent prevalence of patients with all stages of disease (i.e. resectable and unresectable/metastatic) in US, EU5 and Japan.

Cash to fund operating expenses and capital expenditure requirements into late 2018

SHARES OUTSTANDING *as of 12/13/16*	OUTSTANDING DEBT *as of 9/30/16*	CASH, CASH EQUIVALENTS AND INVESTMENTS *as of 9/30/16*
33.1 million (basic)	*$4.9 million*	*$152.5 million*

Received net proceeds of ~$135 million upon closing of underwritten public offering in December 2016

Financial guidance gives effect to net proceeds received upon closing of underwritten public offering in December 2016 but excludes any potential option fees and milestone payments under Blueprint Medicines' existing collaborations.


blueprint
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Thank you